

**CLAIMS**

#### 1. Protected unsaturated alcohol with formula (1)

$$5 \quad (R^1 - O-)_{mPG} \quad (1)$$

10 substituted ethyl, (substituted) benzyl and (substituted) silyl groups with at least one substituent on the Si-atom being not a methyl group, in case m = 1; and a diol protecting group in case m = 2.

## 2. Protected saturated alcohol with formula (2)

$$(R^2 - O^-)_m PG \quad (2)$$

wherein R<sup>2</sup> represents a linear straight-chain alkyl group with 26-30 C-atoms , m is 1 or 2 and PG represents a protecting group chosen from the group of substituted methyl, substituted ethyl, (substituted) benzyl and (substituted) silyl groups with at least one substituent on the Si-atom being not a methyl group, in case m = 1; and a diol protecting group in case m = 2.

3. Unsaturated alcohol with formula  $R^1OH$  wherein  $R^1$  represents a linear, straight-chain aliphatic hydrocarbon group containing one, two or three double bonds and having 27 C-atoms.

4. Unsaturated alcohol with formula  $R^1OH$  wherein  $R^1$  represents a linear, straight-chain aliphatic hydrocarbon group containing one or more double bonds and having 28 C-atoms with the proviso that when  $R^1$  has one double bond which is between  $C_{18}$  and  $C_{19}$  or between  $C_{19}$  and  $C_{20}$ ,  $R^1OH$  has the E-configuration.

5. Unsaturated alcohol with formula  $R^1OH$  wherein  $R^1$  represents a linear, straight-chain aliphatic hydrocarbon group containing two or three double bonds and having 26-29 C-atoms.

5 6. Process for the preparation of a protected unsaturated alcohol according to claim 1 via an organometallic cross coupling reaction wherein a linear, straight-chain nucleophilic organometallic reagent of formula  $RCH_2M^1$  is reacted with a linear, straight-chain electrophile of formula  $(LG-CH_2-A-O)_mPG$  (or a linear, straight-chain electrophile of formula  $RCH_2-LG$  with a nucleophilic organometallic reagent of formula  $(M^1CH_2-A-O)_mPG$ ), wherein

10  $m = 1$  or  $2$ ,

$R$  is H or a linear, straight-chain aliphatic hydrocarbon group with 1-28 C-atoms, optionally with one or more double bonds,

15  $M^1$  represents Li, Na, K,  $BZ_2$ , wherein each Z independently represents OH, an alkyl or alkoxy group, or the 2 Z-groups together form a hydrocarbon ring,  $MgX$ , wherein X=halogen,  $ZnX$ , wherein X= halogen or  $CH_2Si(CH_3)_3$ , or  $MnX$ , wherein X=halogen,

20 A is a  $C_{0-28}$  linear, straight-chain hydrocarbon group,

LG represents a leaving group,

25 PG represents a protecting group chosen from the group of substituted methyl, substituted ethyl, (substituted) benzyl and (substituted) silyl groups with at least one substituent on the Si-atom being not a methyl group, in case  $m = 1$ ; and a diol protecting group in case  $m = 2$ .

25 7. Process according to claim 6, wherein the cross coupling reaction is performed in the presence of a transition metal catalyst and wherein  $M^1$  represents  $MgX$  with X is halogen.

30 8. Process according to claim 7, wherein the nucleophilic organometallic reagent reacts with an alkyl halide, alkyl arylsulfonate or alkyl mesylate.

9. Process for the preparation of a protected unsaturated alcohol according to claim 1 via a Wittig reaction wherein a straight-chain nucleophilic phosphorous ylide reagent of formula  $R^6CH=PR^7_3$  is reacted with a straight-chain aldehyde of formula

(O=CH-A<sup>1</sup>-O-)<sub>m</sub>PG (or a straight-chain aldehyde of formula RCH=O with a nucleophilic phosphorous ylide reagent of formula (R<sup>7</sup>)<sub>3</sub>P=CH-A<sup>1</sup>-O-)<sub>m</sub>-PG), wherein R<sup>8</sup> is H, a C<sub>1-27</sub> linear straight-chain alkyl or alkenyl group, R<sup>7</sup> is a small alkyl or an aryl group, A<sup>1</sup> is a linear, straight-chain hydrocarbon group with 1-28 C-atoms, m is 1 or 2 and PG represents a protecting group chosen from the group of substituted methyl, substituted ethyl, (substituted) benzyl and (substituted) silyl groups with at least one substituent on the Si-atom being not a methyl group, in case m = 1; and a diol protecting group in case m = 2.

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10 10. Process according to claim 9, wherein the nucleophilic reagent is formed by treatment of a phosphonate reagent of type R<sup>6</sup>CH<sub>2</sub>P(O)(OR<sup>7</sup>)<sub>2</sub> [or ((R<sup>7</sup>O)<sub>2</sub>P(O)CH<sub>2</sub>-A<sup>1</sup>-O-)<sub>m</sub>-PG] with an appropriate strong base, R<sup>8</sup> is H, a C<sub>1-27</sub> linear straight-chain alkyl or alkenyl group, A<sup>1</sup> is a linear, straight-chain hydrocarbon group with 1-28 C-atoms, m is 1 or 2, PG represents a protecting group chosen from the group of substituted methyl, substituted ethyl, (substituted) benzyl and (substituted) silyl groups with at least one substituent on the Si-atom being not a methyl group, in case m = 1; and a diol protecting group in case m = 2 and R<sup>7</sup> represents a small alkyl group.

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20 11. Process for the preparation of a protected unsaturated alcohol according to claim 1 via Olefin Cross Metathesis, wherein a linear, straight-chain terminal olefin of formula R<sup>8</sup>CH=CH<sub>2</sub> is reacted with a linear, straight-chain terminal olefin of formula H<sub>2</sub>C=CH-A<sup>2</sup>-O-PG, wherein R<sup>8</sup> is C<sub>1-27</sub> a linear, straight-chain alkyl group, A<sup>2</sup> is a linear, straight-chain hydrocarbon group with 1-27 C-atoms, m is 1 or 2 and PG represents a protecting group chosen from the group of substituted methyl, substituted ethyl, (substituted) benzyl and (substituted) silyl groups with at least one substituent on the Si-atom being not a methyl group, in case m = 1; and a diol protecting group in case m = 2 in the presence of a metal-based catalyst bearing ligands.

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30 12. Process according to claim 11, wherein the difference in molecular weight of the two olefins preferably is such that the desired product of formula (1) contains at least 5C more or 5C less than the side-product resulting from the homo coupling of the olefin used in excess.

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13. Process according to any one of claims 6-12, wherein first the protected unsaturated alcohol with formula (1) is prepared according to any one of claims 6-12 and subsequently the protected unsaturated alcohol is subjected to reduction and deprotection.